

Binge drinking with chronic alcohol use more destructive than previously thought

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Shivendra Shukla, Ph.D., in his MU School of Medicine laboratory. Credit: Justin Kelley, University of Missouri Health

Excessive alcohol consumption is a global public health issue. In the United States, binge drinking is the most common form—so common, in fact, that the Centers for Disease Control and Prevention reports approximately one in six adults binge drinks about four times each month. Now, a study by University of Missouri School of Medicine researchers shows that chronic alcohol use, when combined with repeated binge drinking, causes more damage to the liver than previously thought.

"Heavy [binge drinking](#) by those who habitually consume [alcohol](#) is the most common cause of [liver damage](#) in chronic alcoholic [liver](#) disease," said Shivendra Shukla, Ph.D., the Margaret Proctor Mulligan Professor of medical pharmacology and physiology at the MU School of Medicine and lead author of the study. "We know that this behavior causes large fatty deposits in the liver that ultimately impair the organ's ability to function properly. However, we wanted to understand the mechanism that causes this

damage and the extent of the harm. Our research focused on different forms of [alcohol abuse](#) and the results of those behaviors."

Shukla's team studied mice to examine the extent of [liver injury](#) caused by chronic alcohol use, repeat binge episodes and a combination of both. During a four-week period, the team found that mice exposed to chronic alcohol use and repeated binge consumption exhibited the highest levels of liver damage.

"Either chronic alcohol use or acute repeat binge episodes caused moderate liver damage when compared to the control group not exposed to alcohol," Shukla said. "This outcome came as no surprise. However, in the mice exposed to both chronic use and repeat binge episodes, liver damage increased tremendously. Even more shocking was the extent of fatty deposits in the livers of those exposed to chronic plus binge alcohol. It was approximately 13 times higher than the control group."

The highly amplified fat accumulation was in part caused by metabolic changes within the liver. These changes not only significantly increased fatty liver deposits, but increased stress on the organ while decreasing the liver's ability to fight the stress.

Shukla also pointed out that chronic and excessive alcohol use should not be associated only with liver damage.

"Drinking alcohol excessively can create an inflammatory response to the liver and other organ systems in the body," Shukla said. "If those organs work at a lower level of function, then a whole host of physiological processes can be affected. It is important for us to understand the extent of damage caused by alcohol abuse, which also can lead to other health issues such as diabetes, cardiovascular disease and some forms of cancer."

Provided by University of Missouri-Columbia

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